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CTCGAGGACAGTGACCTGGGAGTGAGTACAAGGTGAGGCCACCACTCAGGGT
GCCAGCTCCAAGCGGGTCACAGGGACGAGGGCTGCGGCCATCAGGAGGCCCT
GCACACACATCTGGGACACGCGCCCCCGAGGGCCAGTTCACCTCAGTGCGCC
TCATTCTCCTGCACAAAAGCGCCCCCATCCTTTCTTCACAAGGCTTTTCGTGG
AAGCAGAGGCGTCGATGCCCAGTACCCTCTCCCTTTCCCAGGCAACGGGACC
CCAAGTTTGCTGACTGGGACCACCAAGCCACGCATGCGTCAAGAGTGAGAGT
CCGGGACCTAGGCAGGGGCCCCTGGGGTTGGGCCTGAGAGAGAAGAGAACCTC
CCCCAGCACTCGGTGTGCATCGGTAGTGAAGGAGCCTCACCTGACCCCCGCT
GTTGCTCAATCGACTTCCCAAGAACAGAGAGAAAAGGGAACCTCCAGGGCGG
CCCGGGCCTCCTGGGGGTTCCCACCCCATTTTTAGCTGAAAGCACTGAGGCA
GAGCTCCCCCTACCCAGGCTCCACTGCCCCGGCACAGAAATAACAACCACGGT
TACTGATCATCTGGGAGCTGTCCAGGAATTC

FIG._1A

1 GCTGGGCTAA ACTGGGCTAG CCTGAGCTGG GCTGAACTGG GCTGCTGGGC
51 TGGACTGGGT AAGCTGGGCT GAGCTGGGTT GGGTGGAAAT GGGCTGAGCT
101 GAGCTAGGCT AAAGTGGGTT TGGCTGGGCT GGGCTGGGCT GGG

FIG._2B

1 GGTTTGGCTG GGCTGGGCTG GGCTGGGCTG GGTTTCACTG AGCGGGTTGG
51 GTTAGACTGG GTCAAAGTGG TTCAGC

FIG._2C

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GERMLINE & LOCUS

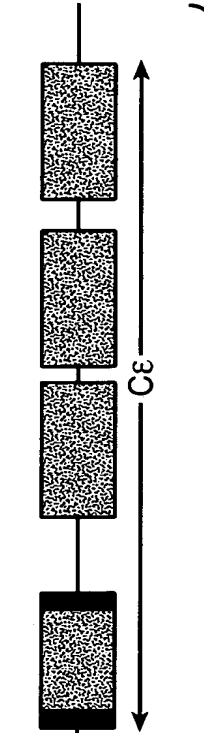
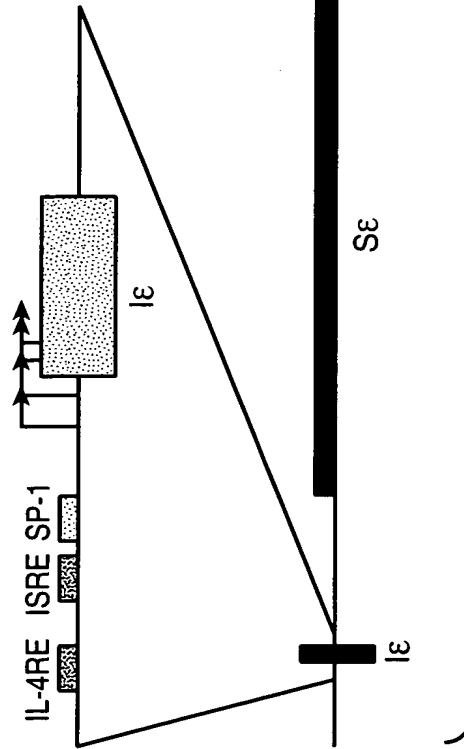
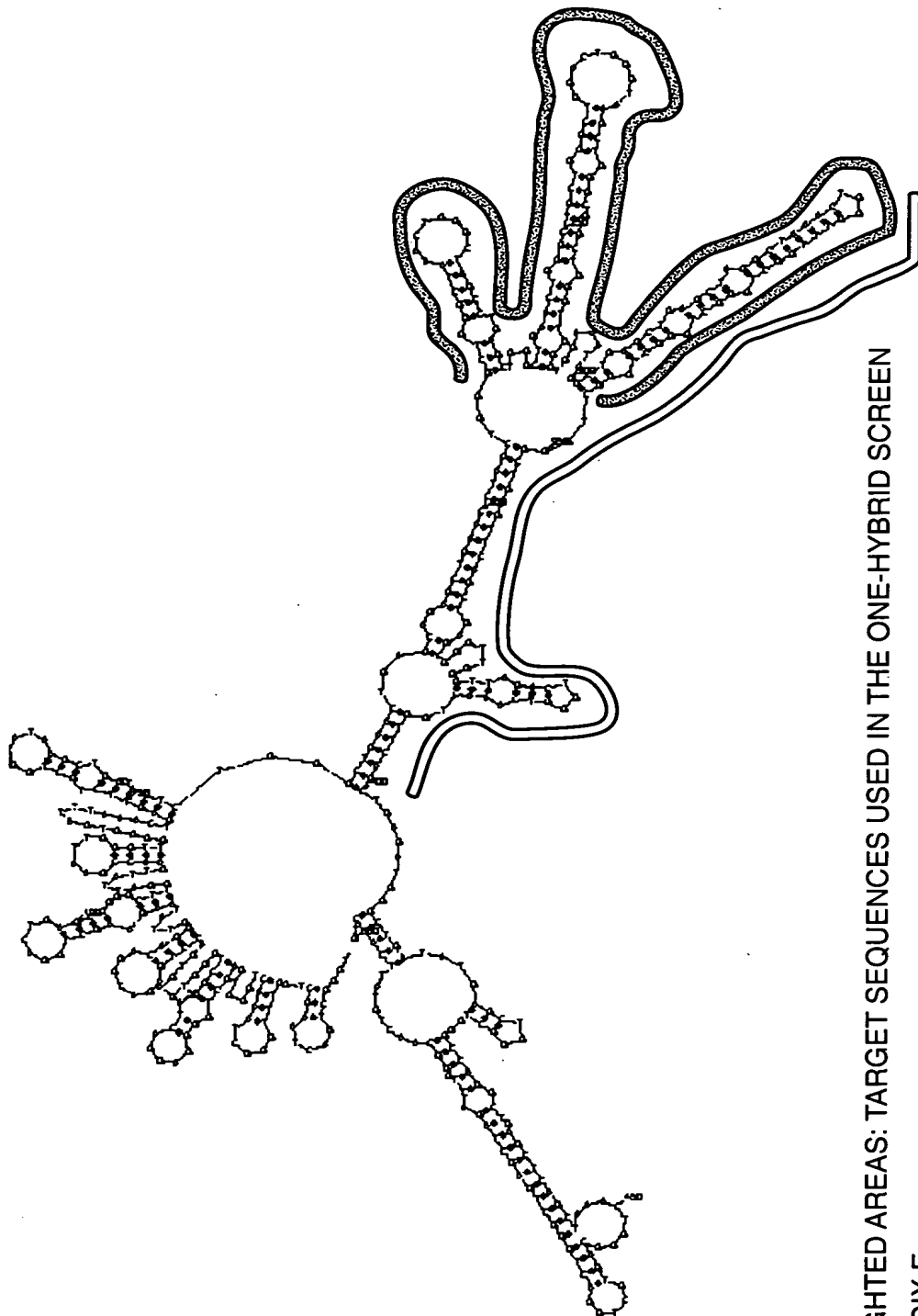


FIG. 1B

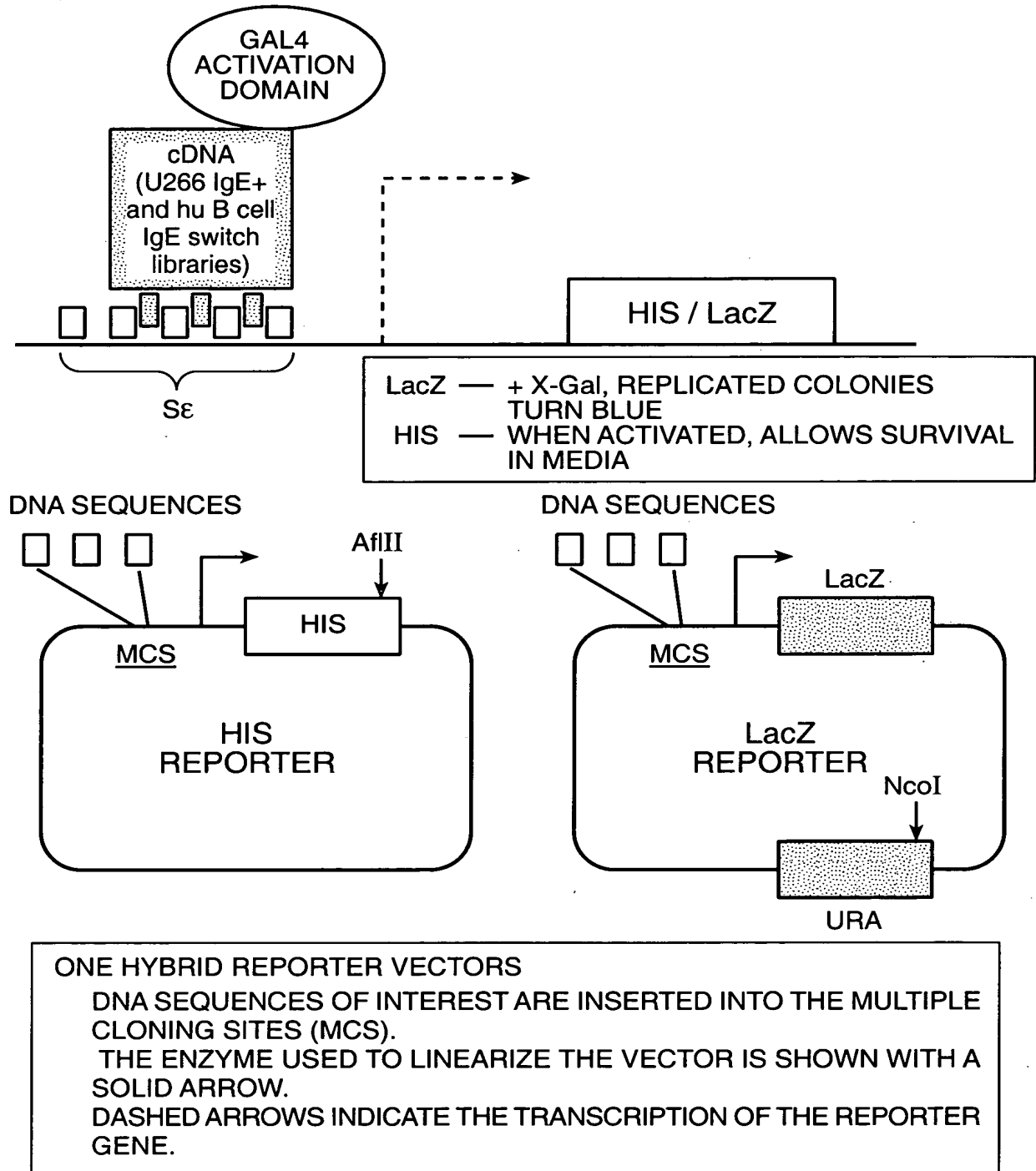
LOW ENERGY DNA FOLDING OF THE S ϵ REGION



HIGHLIGHTED AREAS: TARGET SEQUENCES USED IN THE ONE-HYBRID SCREEN
APPENDIX E

FIG._2A

YEAST ONE-HYBRID SCREENING



APPENDIX F

FIG._3

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IL-4 INDUCTION OF GERMLINE ϵ mRNA IN THE
IgM + B CELL LINES: CA-46, MC-116 AND DND39

DND39 + IL-4

DND39 - IL-4

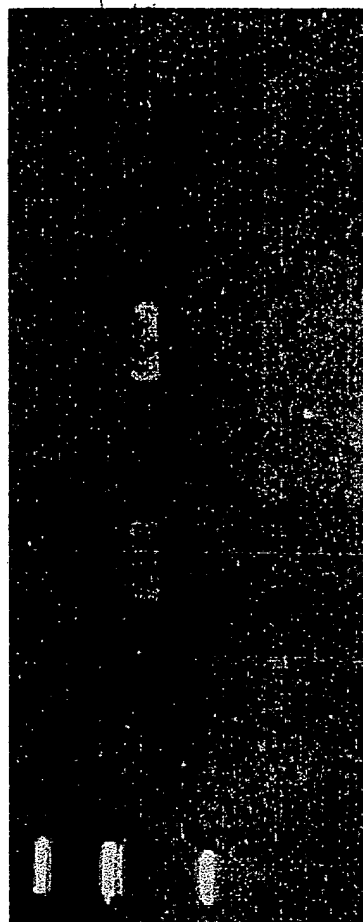
MC-116 + IL-4

MC-116 - IL-4

CA-46 + IL-4

CA-46 - IL-4

NEG. CONT.



246bp

123bp

CELLS WERE INCUBATED FOR 48 HRS. IN 300 U / ml OF h-IL-4.
RT-PCR WAS PERFORMED USING PRIMERS SPECIFIC FOR THE GERMLINE
 ϵ EXON AND THE 5'-END OF THE C ϵ CH1 EXON (PREDICTED SIZE ~ 200 bp).

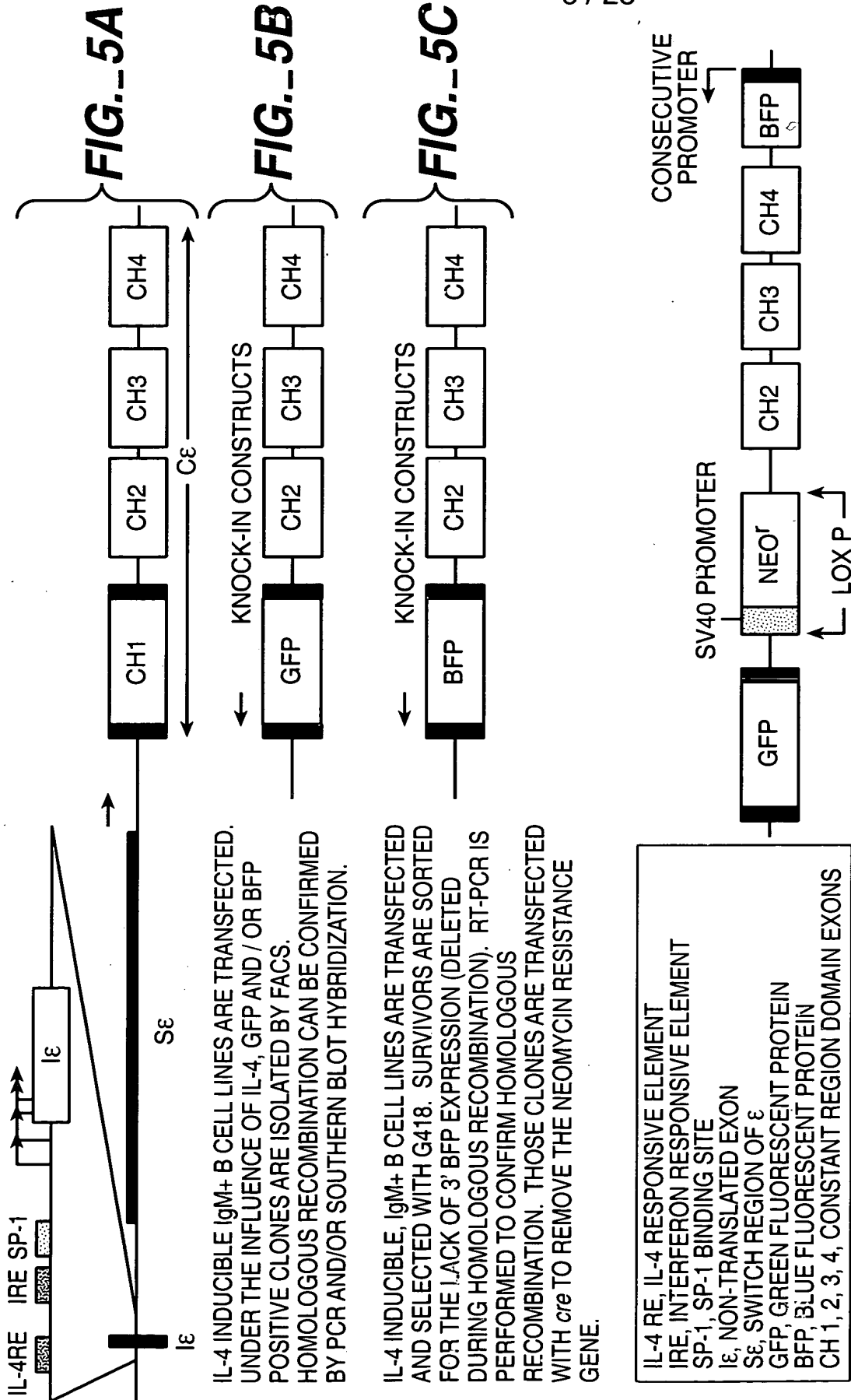
APPENDIX G

FIG. 4

BEST AVAILABLE COPY

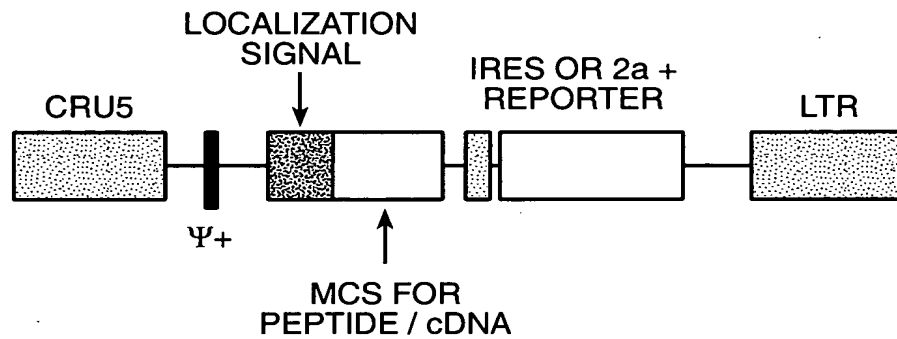
209110-97699660

APPROACHES TO GENERATE GERMLINE ϵ PROMOTER KNOCK-IN REPORTER CELL LINES



APPENDIX A

RIGEL BASE VECTOR



ALL COMPONENTS ARE UNIQUELY CASSETTED FOR FLEXIBILITY

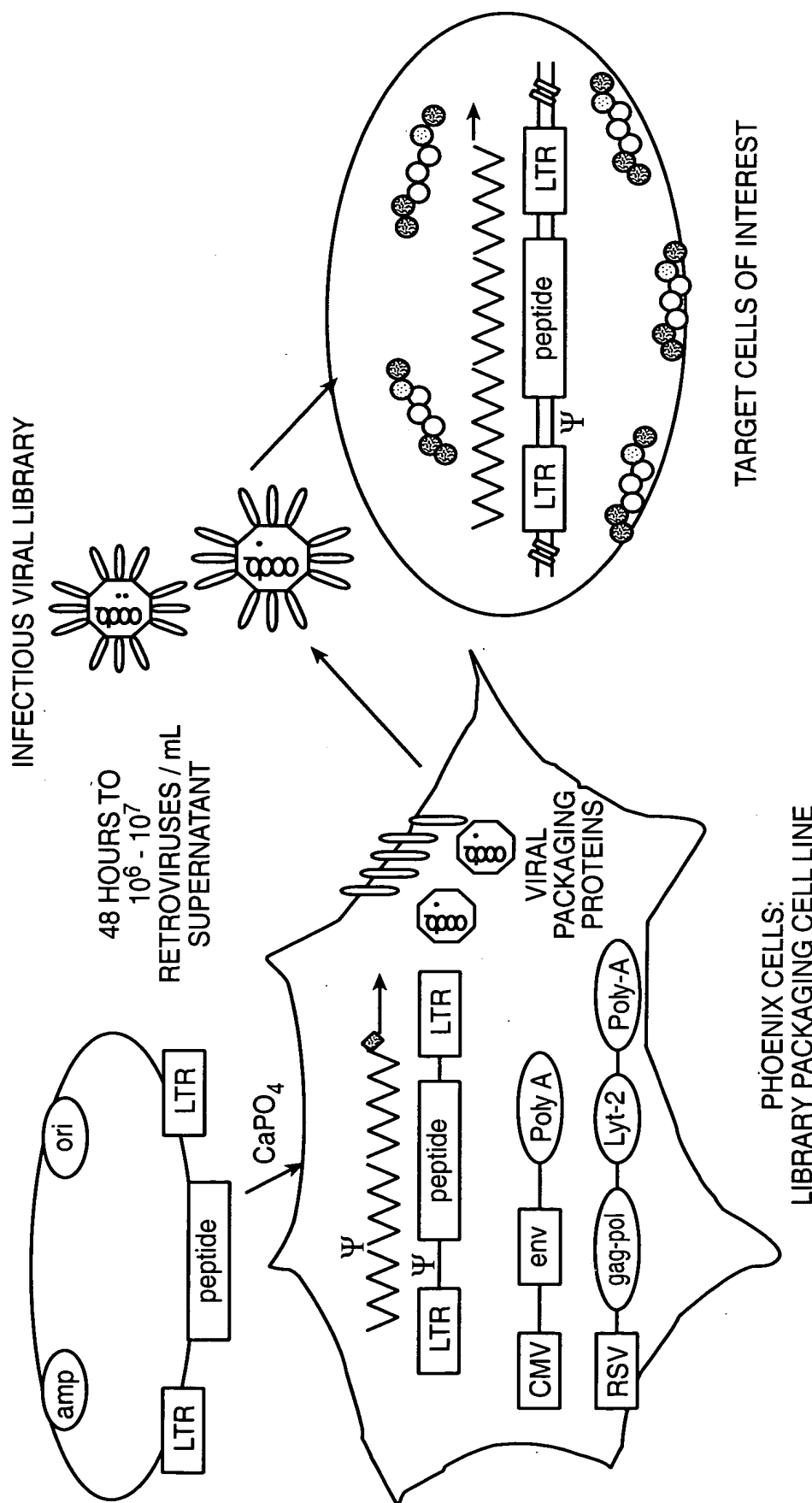
CRU5, MODIFIED LTR
 LTR, LONG TERMINAL REPEAT
 $\Psi+$, PACKING SIGNAL
 LOCALIZATION SIGNAL: NUCLEAR, CELL MEMBRANE, GRANULAR
 MCS, MULTIPLE CLONING SITE
 IRES, INTERNAL RIBOSOME ENTRY SITE
 2a, SELF-CLEAVING PEPTIDE

APPENDIX I

FIG._6

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PROTOCOL FOR TRANSFECTION OF PHOENIX CELLS AND INFECTION OF NONADHERENT TARGET CELLS



APPENDIX I

FIG. 7

ε HEAVY CHAIN GFP / BFP KNOCK-IN CELL LINE
U266 ε HEAVY CHAIN

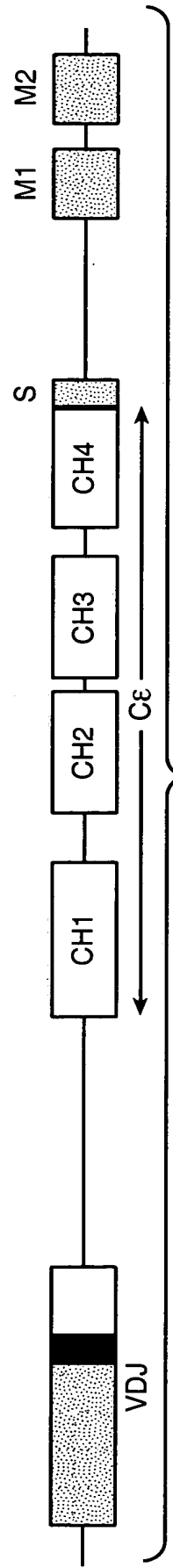
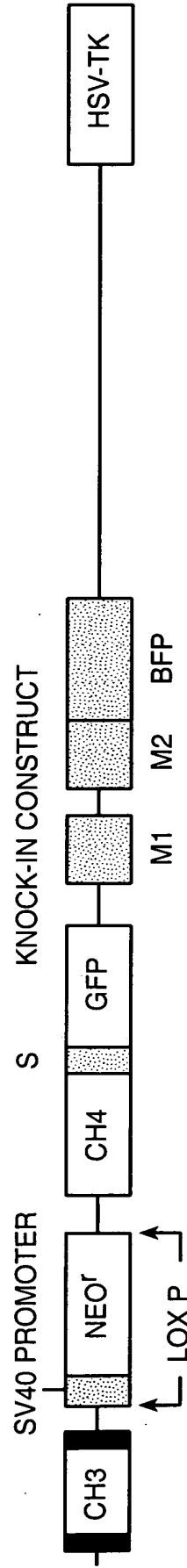


FIG..8A



S, SECRETORY EXON
GFP, GREEN FLUORESCENT PROTEIN
BFP, BLUE FLUORESCENT PROTEIN
Neo^r, NEOMYCIN RESISTANCE GENE
VDJ, V REGION EXON
CH 1, 2, 3, 4, CONSTANT REGION DOMAIN EXONS
M1, M2, MEMBRANE EXONS
HSV-TK, HERPES SIMPLEX VIRUS-THYMIDINE KINASE

U266 CELLS ARE TRANSFECTED AND SELECTED WITH G418. SURVIVORS ARE TREATED WITH GANCICLOVIR (HSV-TK DELETED DURING HOMOLOGOUS RECOMBINATION). RT-PCR IS PERFORMED TO CONFIRM HOMOLOGOUS RECOMBINATION. THOSE CLONES ARE TRANSFECTED WITH *cre* TO REMOVE THE SV40 NEOMYCIN RESISTANCE GENE.

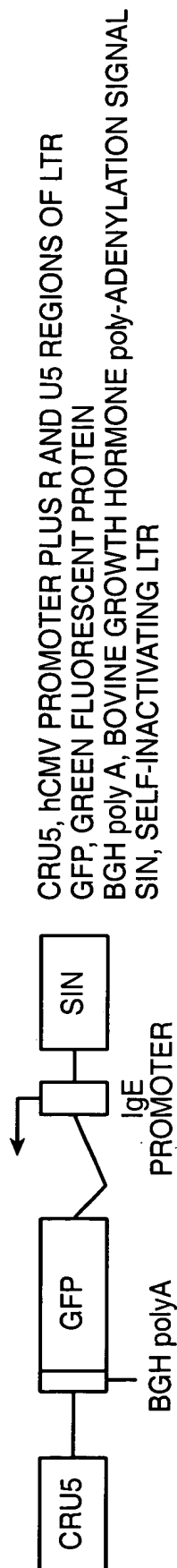
APPENDIX D

FIG..8B

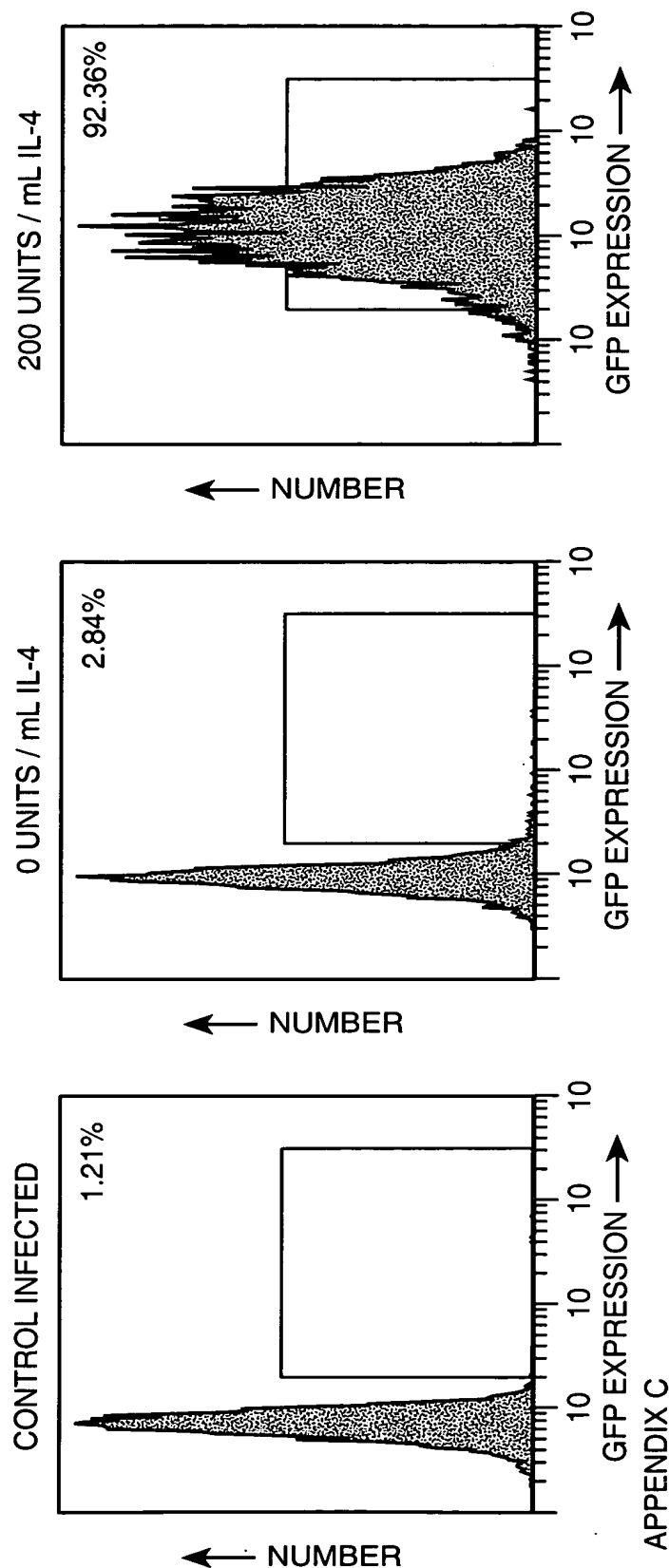
+

IL-4 INDUCIBLE ϵ PROMOTER REPORTER CELL LINE

REPORTER CONSTRUCT



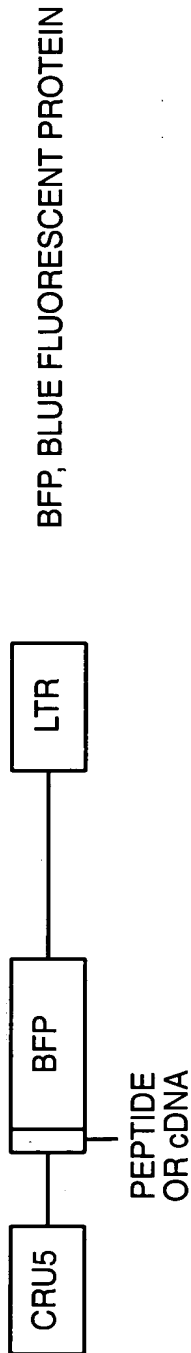
IL-4 INDUCED REPORTER



+

REPORTER LINE INFECTED WITH BFP CONSTRUCT

LIBRARY CONSTRUCT



FACS PROFILE OF CELLS WITH BOTH REPORTER AND PEPTIDE LIBRARY

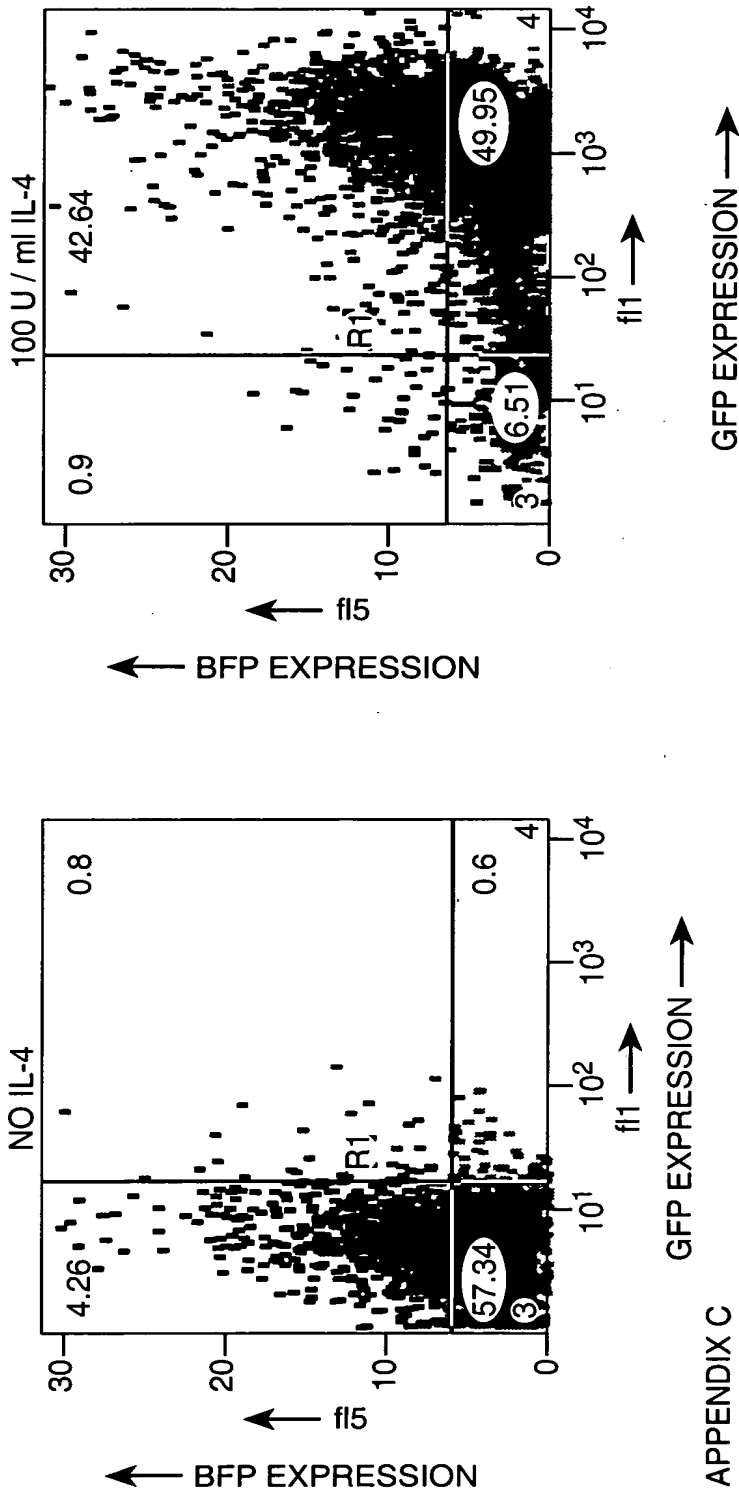
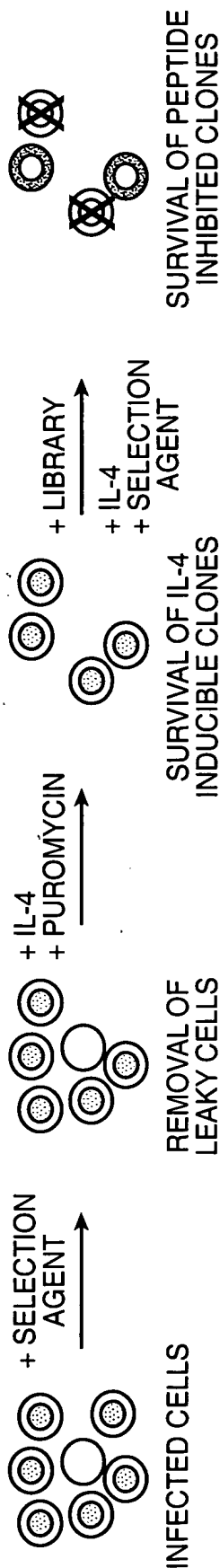
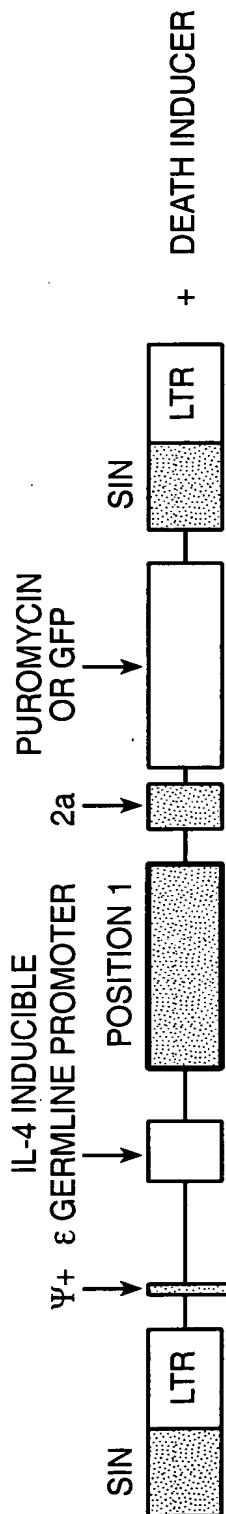


FIG. 9B

SCREEN FOR PEPTIDE INHIBITORS OF THE GERMLINE ϵ PROMOTER



SURVIVAL CONSTRUCT



POSITION 1

FAS CHIMERIC RECEPTOR*

*(MOUSE FASK EXTERNAL / MOUSE CD8 EXTERNAL + HUMAN TRANSMEMBRANE AND CYTOPLASMIC DOMAINS)

SIN, SELF-INACTIVATING LTR
LTR, LONG TERMINAL REPEAT

HSV-TK

P450 2B1

p21 PEPTIDE

ALL COMPONENTS ARE CASSETTED FOR FLEXIBILITY

SELECTION AGENT

α FAS

GANCICLOVIR

CYCLOPHOSPHAMIDE

NONE (SELF SELECTION)

APPENDIX D

FIG..10

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1-845 CMV promoter/R/U5 5' LTR
 1322 GAG ATG-ATC mutation
 850-2100 extended Ψ region
 2146-2173 two Bstx1 peptide cloning sites
 2205-2723 ECMV IRES (cloned as EcoR1/MscI fragment from
 pCITE-4a [Novagen])
 2746-3465 GFP coding region
 3522-4115 3' LTR
 4122-6210 pGEM backbone (pUC origin, ampR)

ATCACGAGGCCCTTTTCGTCTTCAAGAACAGCTTTGCTCTTAGGAGTTTCCTAATACATCC
 CAAACTCAAATATATAAAGCATTTGACTTGTCTATGCCCTAGTTATTAATAGTAATCAA
 TTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCCGCGTTACATAACTTACGGTAA
 ATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGCCCATTTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGT
 AAAGTGGCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACG
 TCAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTC
 CTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGC
 AGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTCCACCCCA
 TTGACGTCAATGGGAGTTTGTGTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTA
 ACAACTCCGCCCCATTGACGCAAATGGGCGGTAGGCATGTACGGTGGGAGGTCTATATAA
 GCAGAGCTCAATAAAAGAGCCCAACCCCTCACTCGGGGCGCCAGTCCTCCGATTGACT
 GAGTCGCCCCGGGTACCCGTGTATCCAATAAACCCCTCTTGACAGTTGCATCCGACTTGTGGT
 CTCGCTGTTCTTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGTCAGCGGGGGTCTTT
 CATTGTTGGGGGCTCGTCCGGGATCGGGAGACCCCTGCCCAGGGACCACCGACCCACCCG
 GGAGGTAAAGCTGGCCAGCAACTTATCTGTGTCTGTCCGATTGTCTAGTGTCTATGACTGA
 TTTTATGCGCCTGCGTCCGTACTAGTTAGCTAACTAGCTCTGTATCTGGCGGACCCGTGG
 TGGAAGTACGAGTTTCGGAACACCCGGCCGCAACCCTGGGAGACGTCCAGGGACTTCGG
 GGGCCGTTTTTGTGGCCCGACCTGAGTCCAAAAATCCCGATCGTTTTGGACTCTTTGGTG
 CACCCCCCTTAGAGGAGGGATATGTGGTTCTGGTAGGAGACGAGAACCTAAAACAGTTCC
 CGCCTCCGTCTGAATTTTTTGCTTTTCGGTTTGGGACCGAAGCCGCGCCGCGCGTCTTGTCT
 GCTGCAGCATCGTTCTGTGTTGTCTCTGTCTGACTGTGTTTCTGTATTTGTCTGAAAATA
 TCGGCCCCGGGCCAGACTGTTACCACTCCCTTAAGTTTGACCTTAGGTCACTGGAAAGATG
 TCGAGCGGATCGCTCACAACCAAGTCGGTAGATGTCAAGAAGAGACGTTGGGTACCTTCT
 GCTCTGCAGAATGGCCAACCTTTAACGTCGGATGGCCGCGAGACGGCACCTTTAACCGAG
 ACCTCATCACCCAGGTAAAGATCAAGGTCTTTTACCTGGCCCGCATGGACACCCAGACC
 AGGTCCCCTACATCGTGACCTGGGAAGCCTTGGCTTTTGACCCCCCTCCCTGGGTCAAGC
 CCTTTGTACACCCTAAGCCTCCGCTCCTCTTCCCTCCATCCGCCCCGTCTCTCCCCCTTG
 AACCTCCTCGTTCGACCCCCGCTCGATCCTCCCTTTATCCAGCCCTCACTCCTTCTCTAG
 GCGCCCCCATATGGCCATATGAGATCTTATATGGGGCACCCCCGCCCCCTTGTAAGTCTCC
 CTGACCCTGACATGACAAGAGTTACTAACAGCCCTCTCTCCAAGCTCACTTACAGGCTC
 TCTACTTAGTCCAGCACGAAGTCTGGAGACCTCTGGCGGCAGCCTACCAAGAACAACTGG
 ACCGACCGGTGGTACCTCACCTTACCGAGTCGGCGACACAGTGTGGGTCCGCCGACACC
 AGACTAAGAACCTAGAACCTCGCTGGAAAGGACCTTACACAGTCCTGCTGACCACCCCCA
 CCGCCCTCAAAGTAGACGGCATCGCGCTTGGATACACGCCGCCACGTGAAGGCTGCCGA
 CCCCCGGGGTGGACCATCCTCTAGACTGCCGGATCTCGAGGGATCCACCACCATGGACCC
 CCATTAAATTGGAATTCCTGCAGCCCCGGGGGATCCACTAGTTCTAGAGCGAATTAATTCC

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FIG. 11A-1

GGTTATTTTCCACCATATTGCCGTCTTTTGGCAATGTGAGGGCCCGGAAACCTGGCCCTG
TCTTCTTGACGAGCATTCTAGGGGTCTTTCCCTCTCGCCAAAGGAATGCAAGGTCTGT
TGAATGTCGTGAAGGAAGCAGTTCCTCTGGAAGCTTCTTGAAGACAAACAACGTCTGTAG
CGACCCTTTGCAGGCAGCGGAACCCCCACCTGGCGACAGGTGCCCTCTGCGGCCAAAAGC
CACGTGTATAAGATACACCTGCAAAGGCGGCACAACCCAGTGCCACGTTGTGAGTTGGA
TAGTTGTGGAAGAGTCAAATGGCTCTCCTCAAGCGTATTCAACAAGGGGCTGAAGGATG
CCCAGAAGGTACCCCATTTGTATGGGATCTGATCTGGGGCCTCGGTGCACATGCTTTACAT
GTGTTTAGTCGAGGTTAAAAAACGTCTAGGCCCCCGAACCACGGGGACGTGGTTTTCTCT
TTGAAAAACACGATGATAATATGGGGGATCCACCGGTGCGCCACCATGGTGAGCAAGGGCG
AGGAGCTGTTACCGGGGTGGTGCCCATCCTGGTGCAGCTGGACGGCGACGTAAACGGCC
ACAAGTTCAGCGTGTCCGGCGAGGGCGAGGGCGATGCCACCTACGGCAAGCTGACCCTGA
AGTTCATCTGCACCACCGGCAAGCTGCCCGTGCCCTGGCCACCCCTCGTGACCACCCTGA
CCTACGGCGTGACGTGCTTCAGCCGCTACCCCGACCACATGAAGCAGCACGACTTCTTCA
AGTCCGCCATGCCCGAAGGCTACGTCCAGGAGCGCACCATCTTCTTCAAGGACGACGGCA
ACTACAAGACCCGCGCCGAGGTGAAGTTCGAGGGCGACACCCTGGTGAACCGCATCGAGC
TGAAGGGCATCGACTTCAAGGAGGACGGCAACATCCTGGGGCACAAGCTGGAGTACAAC
ACAACAGCCACAACGTCTATATCATGGCCGACAAGCAGAAGAAGGGCATCAAGGTGAAC
TCAAGATCCGCCACAACATCGAGGACGGCAGCGTGCAGCTCGCCGACCACTACCAGCAGA
ACACCCCATCGGCGACGGCCCCGTGCTGCTGCCCGACAACCACTACCTGAGCACCCAGT
CCGCCCTGAGCAAAGACCCCAACGAGAAGCGCGATCACATGGTCTGCTGGAGTTCGTGA
CCGCCCGCCGGGATCACTCTCGGCATGGACGAGCTGTACAAGTAAAGCGGCCGCTCGACGA
TAAATAAAAGATTTTATTTAGTCTCCAGAAAAAGGGGGGAATGAAAGACCCACCTGTA
GGTTTGGCAAGCTAGCTTAAGTAACGCCATTTTGCAAGGCATGGAAAAATACATAACTGA
GAATAGAGAAGTTCAGATCAAGGTCAGGAACAGATGGAACAGCTGAATATGGGCCAAACA
GGATATCTGTGGTAAGCAGTTCCTGCCCCGGCTCAGGGCCAAGAACAGATGGAACAGCTG
AATATGGGCCAAACAGGATATCTGTGGTAAGCAGTTCCTGCCCCGGCTCAGGGCCAAGAA
CAGATGGTCCCCAGATGCGGTCCAGCCCTCAGCAGTTTCTAGAGAACCATCAGATGTTTC
CAGGGTGCCCCAAGGACCTGAAATGACCCTGTGCCTTATTTGAACTAACCAATCAGTTCG
CTTCTCGCTTCTGTTCGCGCGCTTCTGCTCCCCGAGCTCAATAAAAGAGCCACAACCCC
TCACTCGGGGCGCCAGTCTCCGATTGACTGAGTCGCCCGGGTACCCGTGTATCCAATAA
ACCCTCTTGCAAGTTGCATCCGACTTGTGGTCTCGCTGTTTCTTGGGAGGGTCTCCTCTGA
GTGATTGACTACCCGTCAGCGGGGGTCTTTTCAATTCGACTTGTGGTCTCGCTGCCTTGG
GAGGGTCTCCTCTGAGTGATTGACTACCCGTCAGCGGGGGTCTTCACATGCAGCATGTAT
CAAAATTAATTTGGTTTTTTTTCTTAAGTATTTACATTAATGGCCATAGTTGCATTAAT
GAATCGGCCAACGCGCGGGGAGAGGCGGTTTGCGTATTGGCGCTCTTCCGCTTCTCTGCT
CACTGACTCGCTGCGCTCGGTTCGCTCGGGCGAGCGGTATCAGTCACTCAAAGGC
GGTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAAAGAACATGTGAGCAAAGG
CCAGCAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCG
CCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGG
ACTATAAAGATAACAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGAC
CCTGCCGCTTACCGGATACCTGTCCGCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCA
TAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTGCTTCGCTCCAAGCTGGGCTGTGT
GCACGAACCCCCGTTTACGCCCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTC
CAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAG
AGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACAC

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FIG. 11A-2

TAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGT
TGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTTGTTTGCAA
GCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGG
GTCTGACGCTCAGTGGAACGAAACTCACGTTAAGGGATTTTGGTTCATGAGATTATCAAA
AAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTGCGCAAATCAATCTAAAG
TATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCTC
AGCGATCTGTCTATTTTCGTTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTAC
GATACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTC
ACGGGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGG
TCCTGCAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTGCCGGGAAGCTAGAGTAAG
TAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTG
ACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCTAACGATCAAGGCGAGTTAC
ATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCTCCTCGATCGTTGTGAG
AAGTAAGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTAC
TGTCATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTG
AGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAACACGGGATAATACCGC
GCCACATAGCAGAACTTTAAAGTGCTCATCATTGAAAACGTTCTTCGGGGCGAAAAC
CTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGTGCACCCAACTG
ATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAA
TGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTT
TCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATG
TATTTAGAAAAATAAACAAATAGGGGTTCCGCGCACATTC

FIG._11A-3

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1-845 CMVpromoter/R/U5 5' LTR
 1322 GAG ATG-ATC mutation
 850-2100 extend d ψ region
 2151-2865 GFP coding region
 2866-2894 GGGSGGG linker
 2895-2952 FMDV 2a cleavage sequence
 2953-3004 Bstx1/Bstx1/HinD3/Hpa1/Sal1/Not1 polylinker
 3052-3645 3' LTR
 3652-5715 pGEM backbone (pUC origin, ampR)

ATCACGAGGCCCTTTTCGTCTTCAAGAACAGCTTTGCTCTTAGGAGTTTCCTAATACATC
 CCAAACCTCAAATATATAAAGCATTGTGACTTGTTCTATGCCCTAGTTATTAATAGTAATC
 AATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCCGCGTTACATAACTTACGG
 TAAATGGCCCGCCTGGCTGACCGCCCAACGACCCCGCCCATTGACGTCAATAATGACG
 TATGTTCCCATAGTAACGCCAATAGGGACTTTCATTGACGTCAATGGGTGGAGTATTT
 ACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTA
 TTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTATGG
 GACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCATGGTGATGCG
 GTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCGAAGTC
 TCCACCCCATTTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCA
 AAATGTCGTAACAACCTCCGCCCCATTGACGCAAAATGGGCGGTAGGCATGTACGGTGGGA
 GGTCTATATAAGCAGAGCTCAATAAAAGAGCCCAACCCCTCACTCGGGGCGCCAGTC
 CTCCGATTGACTGAGTCGCCCCGGGTACCCGTGTATCCAATAAACCCCTCTTGCAAGTTGCA
 TCCGACTTGTGGTCTCGCTGTTTCTTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGT
 CAGCGGGGGTCTTTTCATTTGGGGGCTCGTCCGGGATCGGGAGACCCCTGCCCAGGGACC
 ACCGACCCACCACCGGGAGGTAAGCTGGCCAGCAACTTATCTGTGTCTGTCCGATTGTC
 TAGTGTCTATGACTGATTTTATGCGCCTGCGTCGGTACTAGTTAGCTAACTAGCTCTGT
 ATCTGGCGGACCCGTGGTGGAAGTACGAGTTCGGAACACCCGGCCGCAACCCTGGGAG
 ACGTCCCAGGGACTTCGGGGGGCCGTTTTTGTGGCCCGACCTGAGTCCAAAAATCCCGAT
 CGTTTTGGACTCTTTGGTGCACCCCCCTTAGAGGAGGGATATGTGGTTCTGGTAGGAGA
 CGAGAACCTAAACAGTTCCCGCCTCCGTCTGAATTTTGTCTTTCGGTTTGGGACCGAA
 GCCGCGCCGCGCGTCTTGTCTGCTGCAGCATCGTTCTGTGTTGTCTCTGTCTGACTGTG
 TTTCTGTATTTGTCTGAAAATATCGGCCCGGGCCAGACTGTTACCACTCCCTTAAGTTT
 GACCTTAGGTCACTGGAAAGATGTCGAGCGGATCGCTCACAACCAGTCGGTAGATGTCA
 AGAAGAGACGTTGGGTACCTTCTGCTCTGCAGAATGGCCAACCTTTAACGTCGGATGG
 CCGCGAGACGGCACCTTTAACCGAGACCTCATCACCCAGGTTAAGATCAAGGTCTTTTC
 ACCTGGCCCGCATGGACACCCAGACCAGGTCCCCTACATCGTGACCTGGGAAGCCTTGG
 CTTTTGACCCCCCTCCCTGGGTCAAGCCCTTTGTACACCCTAAGCCTCCGCCTCCTCTT
 CCTCCATCCGCCCCGTCTCTCCCCCTTGAACCTCCTCGTTTCGACCCCGCCTCGATCCTC
 CCTTTATCCAGCCCTCACTCCTTCTCTAGGCGCCCCCATATGGCCATATGAGATCTTAT
 ATGGGGCACCCCCGCCCTTGTAACCTTCCCTGACCCTGACATGACAAGAGTTACTAAC
 AGCCCTCTCTCCAAGCTCACTTACAGGCTCTCTACTTAGTCCAGCACGAAGTCTGGAG
 ACCTCTGGCGGCAGCCTACCAAGAACAACCTGGACCGACCGGTGGTACCTCACCCTTACC
 GAGTCGGCGACACAGTGTGGGTCCGCCGACACCAGACTAAGAACCTAGAACCTCGCTGG
 AAAGGACCTTACACAGTCCTGCTGACCACCCCCACCGCCCTCAAAGTAGACGGCATCGC
 AGCTTGGATACACGCCGCCACGTGAAGGCTGCCGACCCCGGGGGTGGACCATCCTCTA
 GACTGCCGGATCTCGAGGGATCCACCATGGTGAGCAAGGGCGAGGAGCTGTTACCGGG

FIG. 11B-1

GTGGTGCCCATCCTGGTCGAGCTGGACGGCGACGTAAACGGCCACAAGTTCAGCGTGTC
 CGGCGAGGGCGAGGGCGATGCCACCTACGGCAAGCTGACCCTGAAGTTCATCTGCACCA
 CCGGCAAGCTGCCCGTGCCCTGGCCACCCCTCGTGACCACCCTGACCTACGGCGTGCGAG
 TGCTTCAGCCGCTACCCCGACCACATGAAGCAGCACGACTTCTTCAAGTCCGCCATGCC
 CGAAGGCTACGTCCAGGAGCGCACCATCTTCTTCAAGGACGACGGCAACTACAAGACCC
 GCGCCGAGGTGAAGTTCGAGGGCGACACCCTGGTGAACCGCATCGAGCTGAAGGGCATC
 GACTTCAAGGAGGACGGCAACATCCTGGGGCACAAGCTGGAGTACAAC TACAACAGCCA
 CAACGTCTATATCATGGCCGACAAGCAGAAGAACGGCATCAAGGTGAAC T TCAAGATCC
 GCCACAACATCGAGGACGGCAGCGTGCGAGCTCGCCGACCCTACCAGCAGAACACCCCC
 ATCGGCGACGGCCCCGTGCTGCTGCCCCGACAACCACTACCTGAGCACCCAGTCCGCCCT
 GAGCAAAGACCCCAACGAGAAGCGCGATCACATGGTCTGCTGGAGTTCGTGACCGCCG
 CCGGGATCACTCTCGGCATGGACGAGCTGTACAAGGAATTCGGAGGTGGCAGCGGTGGC
 GGTCAGCTGTTGAATTTTGACCTTCTTAAACTTGCGGGAGACGTCGAGTCCAACCCTGG
 GCCCACCACCACCATGGAAGCTTCCATTAAATTTGGTTAACGTCGACGCGGCCGCTCGAC
 GATAAAATAAAAGATTTTTATTATTAGTCTCCAGAAAAAGGGGGGAATGAAAGACCCACCT
 GTAGGTTTGGCAAGCTAGCTTAAGTAACGCCATTTTGCAAGGCATGGAAAAATACATAA
 CTGAGAATAGAGAAGTTCAGATCAAGGTCAGGAACAGATGGAACAGCTGAATATGGGCC
 AAACAGGATATCTGTGGTAAGCAGTTCCTGCCCCGGCTCAGGGCCAAGAACAGATGGAA
 CAGCTGAATATGGGCCAAACAGGATATCTGTGGTAAGCAGTTCCTGCCCCGGCTCAGGG
 CCAAGAACAGATGGTCCCCAGATGCGGTCCAGCCCTCAGCAGTTTCTAGAGAACCATCA
 GATGTTTCCAGGGTGCCCCAAGGACCTGAAATGACCCTGTGCCTTATTTGAACTAACCA
 ATCAGTTCGCTTCTCGCTTCTGTTTCGCGCGCTTCTGCTCCCCGAGCTCAATAAAAGAGC
 CCACAACCCCTCACTCGGGGCGCCAGTCTTCCGATTGACTGAGTCGCCCCGGGTACCCGT
 GTATCCAATAAACCCCTCTTGCAAGTTGCATCCGACTTGTGGTCTCGCTGTTTCTTGGGAG
 GGTCTCCTCTGAGTGATTGACTACCCGTCAGCGGGGGTCTTTTCAATTTCCGACTTGTGGT
 CTCGCTGCCTTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGTCAGCGGGGGTCTTCA
 CATGCAGCATGTATCAAAATTAATTTGGTTTTTTTTTCTTAAGTATTTACATTAAATGGC
 CATAGTTGCATTAAATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTGCATATTGGCGCT
 CTTCCGCTTCTCTCGCTCACTGACTCGCTGCGCTCGGTGCTTCGGCTGCGGCGAGCGGTA
 TCAGCTCACTCAAAGGCGGTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAAA
 GAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGG
 CGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAATCGACGCTCAAGTCAG
 AGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCT
 CGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTT
 CGGGAAGCGTGCGCTTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTC
 GTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTT
 ATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAG
 CAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTG
 AAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCT
 GAAGCCAGTTACCTTCGGA AAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCG
 CTGGTAGCGGTGGTTTTTTTTTGTGTTGCAAGCAGCAGATTACGCGCAGAAAAAAGGATCT
 CAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAAC TCAG
 TTAAGGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATT
 AAAAATGAAGTTTGCGCAAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGT
 TACCAATGCTTAATCAGTGAGGCACCTATCTCAGCGATCTGTCTATTTTCGTTTCATCCAT
 AGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCC
 CCAGTGCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGCAATA

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FIG. 11B-2

AACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCAT
CCAGTCTATTAATTGTTGCCGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGC
GCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTACGCTCGTCGTTTGGTATGGCT
TCATTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAA
AAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAAGTAAGTTGGCCGCAGTGT
TATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTAAGA
TGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCG
ACCGAGTTGCTCTTGCCCGGCGTCAACACGGGATAATACCGCGCCACATAGCAGAACTT
TAAAAGTGCTCATCATTGGAAAACGTTCTTCGGGGCGAAAACCTCTCAAGGATCTTACCG
CTGTTGAGATCCAGTTCGATGTAACCCACTCGTGCACCCAACTGATCTTCAGCATCTTT
TACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAGG
GAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTCAATATTATTGA
AGCATTTATCAGGGTTATTGTCTCATGACATTAACCTATAAAAATAGGCGT

FIG._11B-3

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1-845 CMVpormoter/R/U5 5' LTR
 1322 GAG ATG-ATC mutation
 850-2100 extended ψ region
 2146-2173 two Bstx1 peptide cloning sites
 2173-2214 Eor1/Apa1/Hpa1/Not1 polylinker
 2262-2855 3' LTR
 2855-4901 pGEM backbone (pUC origin, ampR)

ATCACGAGGCCCTTTCGTCTTCAAGAACAGCTTTGCTCTTAGGAGTTTCCTAATACATC
 CCAAACCTCAAATATATAAAGCATTGACTTGTTCTATGCCCTAGTTATTAATAGTAATC
 AATTACGGGGTCATTAGTTCATAGCCATATATGGAGTTCGCGGTTACATAACTTACGGT
 AAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGCCCATTTGACGTCAATAATGACGT
 ATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTA
 CGGTAAACTGCCCACCTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTAT
 TGACGTCAATGACGGTAAATGGCCCGCCTGGCATTATGCCAGTACATGACCTTATGGG
 ACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCATGGTGATGCGG
 TTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCGAAGTCT
 CCACCCCATTTGACGTCAATGGGAGTTTGTGTTTGGCACCAAAATCAACGGGACTTTCCAA
 AATGTCGTAACAACCTCCGCCCCATTGACGCAATGGGCGGTAGGCATGTACGGTGGGAG
 GTCTATATAAGCAGAGCTCAATAAAAGAGCCACAACCCCTCACTCGGGGCGCCAGTCC
 TCCGATTGACTGAGTCGCCCGGGTACCCGTGTATCCAATAAACCCCTCTTGACAGTTGCAT
 CCGACTTGTGGTCTCGCTGTTCCCTTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGTC
 AGCGGGGGTCTTTTCAATTTGGGGGCTCGTCCGGGATCGGGAGACCCCTGCCAGGGACCA
 CCGACCCACCACCGGGAGGTAAGCTGGCCAGCAACTTATCTGTGTCTGTCCGATTGTCT
 AGTGTCTATGACTGATTTTATGCGCCTGCGTCCGGTACTAGTTAGCTAACTAGCTCTGTA
 TCTGGCGGACCCGTGGTGGAACTGACGAGTTCGGAACACCCGGCCGCAACCCCTGGGAGA
 CGTCCCAGGGACTTCGGGGGCGGTTTGTGTTGGCCGACCTGAGTCCAAAAATCCCGATC
 GTTTTGGACTCTTTGGTGCACCCCCCTTAGAGGAGGGATATGTGGTTCTGGTAGGAGAC
 GAGAACCTAAACAGTTCCCGCCTCCGTCTGAATTTTGGCTTTCGGTTCGGGACCGAAG
 CCGCGCCGCGCGTCTTGTCTGCTGCAGCATCGTTCTGTGTTGTCTCTGTCTGACTGTGT
 TTCTGTATTTGTCTGAAAATATCGGGCCCGGGCCAGACTGTTACCACTCCCTTAAGTTTG
 ACCTTAGGTCACTGGAAAGATGTCGAGCGGATCGCTCACAACCAGTCGGTAGATGTCAA
 GAAGAGACGTTGGGTACCTTCTGCTCTGCAGAATGGCCAACCTTTAACGTCGGATGGC
 CGCGAGACGGCACCTTTAACCGAGACCTCATCACCCAGGTTAAGATCAAGGTCTTTTCA
 CCTGGCCCGCATGGACACCCAGACCAGGTCCCCTACATCGTGACCTGGGAAGCCTTGGC
 TTTTGACCCCCCTCCCTGGGTCAAGCCCTTTGTACACCCTAAGCCTCCGCTCCTCTTC
 CTCCATCCGCCCCGTCTCTCCCCCTTGAACCTCCTCGTTTCGACCCCGCCTCGATCCTCC
 CTTTATCCAGCCCTCACTCCTTCTCTAGGCGCCCCCATATGGCCATATGAGATCTTATA
 TGGGGCACCCCCGCCCCCTTGTAACCTTCCCTGACCCTGACATGACAAGAGTTACTAACA
 GCCCTCTCTCCAAGCTCACTTACAGGCTCTCTACTTAGTCCAGCACGAAGTCTGGAGA
 CCTCTGGCGGCAGCCTACCAAGAACAACTGGACCGACCGGTGGTACCTCACCTTACCG
 AGTCGGCGACACAGTGTGGGTCCGCCGACACCAGACTAAGAACCTAGAACCTCGCTGGA
 AAGGACCTTACACAGTCCTGCTGACCACCCCCACCGCCCTCAAAGTAGACGGCATCGCA
 GCTTGGATACACGCCGCCACGTGAAGGCTGCCGACCCCGGGGGTGGACCATCCTCTAG
 ACTGCCGGATCTCGAGGGATCCACCACCATGGACCCCATTAATTTGGAATTCGGGGCC
 CAAGCTTTGTAAACGTCGACGCGGCCGCGCTCGACGATAAAATAAAGATTTTATTTAG
 TCTCCAGAAAAAGGGGGGAATGAAAGACCCACCTGTAGGTTTGGCAAGCTAGCTTAAG
 TAACGCCATTTTGCAAGGCATGGAAAAATACATAACTGAGAATAGAGAAGTTCAGATCA

FIG. 11C-1

AGGTCAGGAACAGATGGAACAGCTGAATATGGGCCAAACAGGATATCTGTGGTAAGCAG
TTCCTGCCCCGGCTCAGGGCCAAGAACAGATGGAACAGCTGAATATGGGCCAAACAGGA
TATCTGTGGTAAGCAGTTCCTGCCCCGGCTCAGGGCCAAGAACAGATGGTCCCCAGATG
CGGTCCAGCCCTCAGCAGTTTCTAGAGAACCATCAGATGTTTCCAGGGTGCCCCAAGGA
CCTGAAATGACCCTGTGCCTTATTTGAACTAACCAATCAGTTCGCTTCTCGCTTCTGTT
CGCGCGCTTCTGCTCCCCGAGCTCAATAAAAGAGCCCACAACCCCTCACTCGGGGCGCC
AGTCTCCGATTGACTGAGTCGCCCCGGGTACCCGTGTATCCAATAAACCCCTCTTGCACT
TGCATCCGACTTGTGGTCTCGCTGTTCCCTTGGGAGGGTCTCCTCTGAGTGATTGACTAC
CCGTACGCGGGGGTCTTTCATTTCCGACTTGTGGTCTCGCTGCCTTGGGAGGGTCTCCT
CTGAGTGATTGACTACCCGTACGCGGGGGTCTTCACATGCAGCATGTATCAAAATTAAT
TTGGTTTTTTTTTCTTAAGTATTTACATTAAATGGCCATAGTTGCATTAATGAATCGGCC
AACGCGCGGGGAGAGGCGGTTTGCATATTGGCGCTCTTCCGCTTCTCGCTCACTGACT
CGCTGCGCTCGGTGCTTCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCGGTAATA
CGGTTATCCACAGAATCAGGGGATAACGCAGGAAAGAACATGTGAGCAAAAGGCCAGCA
AAAGGCCAGGAACCGTAAAAAGGCCGCGTGTGCTGGCGTTTTTCCATAGGCTCCGCCCCC
CTGACGAGCATCACAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTA
TAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCT
GCCGCTTACCAGGATACCTGTCCGCTTTCTCCCTTCGGGAAGCGTGCGCTTTCTCATA
GCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTGCTTCGCTCCAAGCTGGGCTGTGTG
CACGAACCCCCCGTTACAGCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTC
CAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCA
GAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTAC
ACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAG
AGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTTGTTT
GCAAGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCT
ACGGGGTCTGACGCTCAGTGGAACGAAAACCTCACGTTAAGGGATTTTGGTCATGAGATT
ATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTGCGCAAATCAA
TCTAAAGTATATATGAGTAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCA
CCTATCTCAGCGATCTGTCTATTTTCGTTTCATCCATAGTTGCCTGACTCCCCGTCGTGTA
GATAACTACGATACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAG
ACCCACGCTCACCGGCTCCAGATTTATCAGCAATAAACAGCCAGCCGGAAGGGCCGAG
CGCAGAAGTGGTCTGCAACTTTATCCGCTCCATCCAGTCTATTAATTGTTGCCGGGA
AGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAG
GCATCGTGGTGTACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGA
TCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGTCTCCTTCGGTCC
TCCGATCGTTGTCAGAAGTAAGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCAC
TGCATAATTCTCTTACTGTCTATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGAGTAC
TCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTC
AACACGGGATAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTTGGAAAAC
GTTCTTCGGGGCGAAAACCTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAA
CCCCTCGTGCACCCAACCTGATCTTCAGCATCTTTTACTTTTACCAGCGTTTCTGGGTG
AGCAAAAACAGGAAGGCAAAATGCCGCAAAAAGGGAATAAGGGCGACACGGAAATGTT
GAATACTCATACTCTTCTTTTTTCAATATTATTGAAGCATTATCAGGGTTATTGTCTC
ATGACATTAACCTATAAAAATAGGCGT

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FIG._11C-2

(1) C12ScFas Survival construct

C12ScFas: psilon-cFas(CD95)-Ires-Hygro-BGH PolyA put into C12s vector backwards so that no leaky transcription happens through the cmv promoter.

atcacgagggcccttcgtcttcaagaacagcgtttgctcttaggagtttccctaatacatccccaaactcaaatatataaagc
attgacttggttctatgccctagttattaatagtaatacaattacggggtcattagttcatagcccatatataatggagttccg
cgttacataaacttacggtaaatggccgcctggctgacggcccaacgaccccccgcattgacgtcaataatgacgtatg
ttcccatagtaacgccaatagggaactttccattgacgtcaaatgggtggagttattacggtaaaactgcccaattggcagta
catcaagtgtatcatatgccaagtacgccccctattgacgtcaatgacgttaaatggccgcctggcattatgcccagta
catgaccttatgggaactttccctacttgggcagttacatctacgtattagtcacgtattacccatgggtgatgctgtttggc
agtacatcaatggcggtggatagcggtttgactcacgggatttccaaagtctccaccccatgacgtcaaatgggagtttg
tttggcaccaaaatcaacgggactttccaaaatgtcgtaaactccgccccattgacgcaaatggcggtaggcatgt
acggtgggaggtctatatagaagcagagctcaataaaagagcccaaacccctcactcggggcgccagtcctccgattgact
gagtcgcccgggtacccgtgtatccaaataaacccctcttgcatcggacttggtctcgctgttccttgggaggg
tctcctctgagtgattgactaccgtcagcggggtctttcatttggggctcgctcgggattggtcggagacccctgcccag
ggaccacgacccaccgggaggtgaagctggccagcaacttatctgtgtctgtccgattgtctagtgctatgactga
ttttatgcgctcggtcggtactagttagtaactagctctgtatctggggacccgtggtggaaactgacgagttcggaa
cacccggccgcaaccctgggagacgtcccagggaactcgggggcgtttttgtggcccgacctgagtccaaaaaatccccga
tcgttttggaactcttggcgacccccccttagaggaggatagtggttctggtaggagacgagaaccttaaaacagttcc
cgctccgctgaattttgcttccggttgggacggaagccgcgcgtcttgtctgctgacgacatcgttctgtgt
tgtctctgtcgtgactgtttctgtatttctgtctgaaataatgggccccggccagactgttaccactcccttaagtttgac
cttaggtcacgtggaaaagatgtcgagcggtatcgctcacaaaccagtcggtagatgtcaagaagagacgttgggttaccttct
gctctgcagaaatggccaacctttaacgtcggatggccgcgagacggcacctttaaccgagacctcatcacccaggttaag
atcaagggtctttcacctggcccgcatggacacccagaccaggtccccctacatcgtgacctgggaagccttggccttttga
ccccctccccgggtcaagccctttgtacacccctaaagccctccgtctcttctccatccgccccgtctctcccccttg
aacctcctcgttcgaccccgctcgatcctccctttatccagccctcactccttctctagggcgcccccatatggcccatat
gagatcttataatggggcaccccccgcccttgtaaaacttccctgacctgacatgacaagagttactaaacagccccctctct
ccaagctcacttacaggctctctacttagtcagcacgaagtctggagacctctggcgcgacgacctaccaagaacaaactgg
accgacgggtgttacctcaccccttaccgagtcggcgacacagtggtgggtcccgacacccagactaaagaacctagaacct
cgctggaaaggaccttacacagtcctgctgacacccccacccctcaaaagtacgggcatcgagcttggatcacgc
cgccacgtgaaggctgccgacccccgggtggaccatcctctagactcgggatctcgagggatcctccccagcatGCC

TGCTATTGCTTCCCAATCCTCCCCCTTGCTGTCTGCTGCCCCACCCCAAGATAAGATGACACCTACTCAGACAA

TGCGATGCAATTTCCTCATTTTATTAGGAAAGGACAGTGGGAGTGGCACCTTCCAGGGTCAAGGAAGGCACGGGGGAGGG

GCAACAACAGATGGCTGGCAACTAGAAAGGCACAGTCGAGGCTTAGCTTGCCAAACCTACAGGTGGGGTCTTTTCATTCCC

FIG.-12A

CCCTTTTCTGGAGACTAAATAAAATCTTTTATTatcgatagatcccggctcggcacatctactctattccttgcctctcg
gacgagtgcctggggcgtcgggttccactatcggcgagtaacttctacacagccatcgggtccagacggcgccgttcttgcgg
gcgatttgtgtacgcccagacagtcgggctccggatcggagattgcgtcgatcgacccctgcgcccgaagctgcacatc
gaaattgcgctcaaccaagctctgatagagtgggtcaagaccaaagcggagcatatacgcccggagccgcccgcgacatccctg
caagctccggatgcctccgctcgaagttagcggctctgctgctccatacaagccaacccggcctccagaagaagatggtg
gcgacctcgtattgggaatccccgaacatcgccctcgctccagtcgaatgacggctgttatgcgggccattgtccgtcaggac
attgttggagccgaaatccgctgcacgaggtgcggacttcggggcagtcctcgcccgaagcatcagctcatcgagag
cctgcgcgacggacgactgacgggtgctgctccatcacagtttgcagtgatacacatggggatcagcaatcgcgcacatg
aaatcacgccaatgtagtattgacggaattccttgcggtccgaatgggcccgaacccgctcgtctggttaagatcggccgc
agcatcgcatccatggcctccgacggcctgcgaacacgagggcagttcgggttccaggcaggtccttgcaacgtgacac
cctgtgcagggcgagatgcaataggtcaggtcctgcgtacaaatccccaaatgccaagcactccggaaatcgggagcg
gccgatgcaagtgcgataaaacataacgatccttgtagaaacacatcgggcagctatttaccgcaggacatatccacg
ccctcctacatcgaagtgaagcacgagatccttcgcccctcgagagctgcatcaggtcgagacgctgtcgaaacttt
cgatcagaaacttctcgacagacgctcgcggtgagttcaggcttttcatggtattatcatcgtgttttcaaggaaac
cacgtccccgtggttcggggggtcctagacgttttttaacctcgactaaacacatgtaagcatgtgcacgagggccccag
atcagatccccatacaaatgggtaccttctgggcaccccttcagccccttggtaacgcttgaggagagccatttgactc
tttccacaactatccaaactcaaacgtggcactgggttgcgccccttgcaggtgtatcttatcacagtggttcttgg
ccgcagaggcacctgtcgcaggtgggggtcgcgtgcctgcaaaagggtcgctacagacgttgttgccttcaagaagc
ttCCAGAGGAAC TGCTTCCTTACGACATTCAACAGACCTTGCACTTCTTGCGAGAGGGGAAAGACCCctagactaga
ccaagctttggatttcattctgaagtttgaattttctgagtcactagtaatgtccttgaggatgatatgtgaattttc
tctgcaagagtacaaagattggcttttttgagatctttaaatacaatgtgtcatacgcttcttcttccatgaagttgatg
ccaattacgaagcagttgaactttctgttctgctgtcttggacattgtcattcttgcactcctatcttcttggcttcat
tgacacacattcttccgaacaaagcctttaacttgacttagtgcacccagcaatagtggtgatatatttactcaag
tcaacatcagataaaatttattgccaactgtttcaggatttaagggttgagattcattgagaaccccttggttttcttctgtg
cttctctgcatgttttctgtacttcttcttcccccacaaatagtggaatttggaataatggcaaaagaaagaaagccacc
ccaaaccggttTCTGGGACTTTGTTTCCCTGCAGTTTGTATTGCTGGTGTGCTGCAATGGCTCAAGGGTTCCATGTTTCACAC
GAGGGCGACGGAACACAGTGTTTCACAGCCAGGAGAAATCGCAGTAGAAGTCTGGTTTGGCACTTGCACTTGGTATTCTGGGT
CAGGGTGACAGTTTGTTCACCTTCTAAACCATGCTCTTTCATCGCAGAGTGTGCATCTTCTGCACTTATTCAGCATAAATGGT
TCTTGTCATGTACTCCTTCCTTCTGTGCAATGGGGCACAGGTTGGTGTACCCCCCATTCATTTTGCAGTCTCTCAACTTTT
TTTTTACCAGGTTGGCATGTTGACAGCAAAATGGGCCCTCCTTGATATAATCCTTCTGAGCAGTTTTTTATCAGTTTCATG
AACCCGCCCTCCTCAGCTTTAAACTCTCGGAGATGCTATTAGTACCTTGAGTATGAACCTTAACTGTGAGCCAGCAAGCA

FIG.-12B

CCAGAGGCAGGACAGCCAGATCCACACCATgGTGGCTTTACCAACAGTACCGGAATGCCAAGCTTGCGGCCGCTTAAGA
GCTGTAATTGAACCTGGGAGTGGACACCTGTGGAGAGAAAGGCAAAAGTGGATGTCAAGTAAAGACCAATAGGTGCCTATCAG
AAACGCAAGAGTCTTCTCTGTCTCGACAAGCCAGTTTCTATTGGTCTCCTTAAACCTGTCTTGTAAACCTTGATACTTAC
CTGCCCAGTGCCCTCACGACCAACTTctgcaggaaatccctggacagctcccagatgatcagtaaacctggtgttatttct
gtgccgggcagtgagcctgggtaggggagctctgcctcagtgctttcagctaaaaatggggtgggaacccccCaggagg
cccgggccgctggaagtccctttctctctgttcttgggaagtctgattgagcaacagcggggtcaggtgaggtctcc
ttcaactaccgatgcacacccagtgctGggggagggttctctctctcagggcccaacCccagggccccctgacctagggtccc
ggactctCactcttgacgcatgcgtggcttgggtgggtcccagtcagcaaaacttggggtcccggttgcctgggaaggaggag
ggtaactgggcatcgacgctctgcctccacgaaaagccttgtgaagaaaaggatggggggcgttttbtgtgcaggagaaatgagg
cgcaactgaggtgaactggccctcggggGcggtgtccccagatgtgtgtgcaggggcctcctgatggccgcagccctcgtcc
ctgtgaccccgcttgagagctggcaccctgagtggtggcctcacCTTGTACTCCTCCAGGTCACTGTCTCctcgacGCGGGCC
GCTCGAcgatAAAAATAAAGATTTTATTAGTCTCCAGAAAAAGGGGGGAATGAAAGACCCACCTGTAGTTTGGCAAG
ctagctTAAGTAACCCATTTTGCAAGGCATGGAAAAATACATAACTGAGAATAGAGAAAGTTCAGATCAAGGTCGGAACAG
ATGGAACAGGCAATAAAAGAGCCCAACCCCTCACTCGGGGCGCCAGTCTCCGATTGACTGAGTCGCCCGGTACCCG
TGTATCCAATAAAACCTCTTGCAGTTGCATCCGACTTGTGGTCTCGCTGTCTCTTGGGAGGGTCTCCTCTGAGTGATTGA
CTACCCGTCAGCGGGGTCTTTCAcatgcagCATGTATCAAAAATTAATTTGGTTTTTTTCTTAAGTATTACATTAAT
GGCCATagtttcGTAATCATGGTTCATAGCTGTTTCCGTGTGAAATTGTTATCCGCTCACAAATCCACACAACATACGAG
CCGGAAGCATAAAGTGTAAGCCTGGGGTGCCCTAATGAGTGAGCTAACTCACATTAATTGCGTTGCGCTCACTGCCCGCT
TTCCAGTCGGGAAACCTGTCTGCGCCAGCTGCATTAATGAATCGGCCAACCGCGGGGAGAGCGGTTTGCGTATTGGGCG
CTCTTCCGCTTCCCTCGCTCACTGACTCGCTGCGCTCGGTCGTTCCGCTGCGGCGAGCGGTATCAGCTCACTCAAAAGGCGG
TAATACGGTTATCCACAGAAATCAGGGGATAACGCAGGAAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGT
AAAAAGGCCGCGTGTGTCGGCTTTTCCATAGGCTCCGCCCCCCCTGACGAGCATCAAAAAATCGACGCTCAAGTCAGAG
GTGGCGAAACCCGACAGGACTATAAGATACCAGGCGTTTCCCCCTGGAAAGCTCCCTCGTGGCTCTCCTGTTCCGACCC

TGCCGCTTACCGGATACCTGTCCGCCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTC
AGTTCGGGTAGGTTCGCTCCAAAGCTGGGCTGTGTGCACGAACCCCCCGTTTCAGCCCGACCGCTGCCCTTATCCGG
TAACTATCGTCTTGAGTCCAAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAG
CGAGGTATGTAGCGGTGCTACAGAGTTCTTGAAGTGGTGCCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATC
TGGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAAGAGTTGGTAGCTCTTGATCCGGCAAAACAAACCCGCTGGTAGCGG
TGGTTTTTTTGTGCAAGCAGCAGATTACGGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTCTACGGGGT
CTGACGCTCAGTGGAACGAAAACTCACGTTAAGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCCTT
TTAAATTAAAAATGAAGTTTGGCAAAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAAT
CAGTGAGGCACCTATCTCAGCGATCTGTCTATTTTCGTTTCATCCATAGTTGCTTACTCCCGCTCGTGTAGATAACTACGA
TACGGGAGGGCTTACCATCTGGCCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTATCAGCA
ATAAACCCAGCCCGGAAGGGCCGAGCGCAGAAAGTGGTCTTGCAACTTTATCCGCCCTCCATCCAGTCTATTAATTGTTG
CCGGGAAGCTAGATAAGTAGTTCGCCCAGTTAATAGTTTGGCCAACGTTGTGTCATTGCTACAGGCATCGTGGTGTCCAC
GCTCGTCGTTTGGTATGGCTTCATTTCAGCTCCGGTTCCCAACGATCAAGCGAGTTACATGATCCCCCATGTTGTGCAAA
AAAGCGGTAGCTCCTTCGGTCCCGATCGTTGTTCAGAAGTAAGTTGGCCGCGAGTGTATCACTCATGGTTATGGCAGC
ACTGCATAAATCTCTACTGTGTCATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGagtactcaaccaagtcatctgag
aatagtgtatgcggcgaccgagttgctcttgcggcggtcaacacgggataataccgcgcacatagcagaactttaaa
gtgctcatcatggaaaaagttcttcggggcgaaaaactctcaaggatcttaccgctgttgagatccagttcgatgtaacc
cactcgtgcacccaactgatcttcagcatctttactttcacccagcgtttctgggtgagcaaaaaacaggaaagcgaatg
ccgcaaaaaagggaataaggcgacacggaaaatgttgaatactcatctctctcttttcaatatatttgaagcatttat
cagggttatgtctcatgacattaacctataaaaaataggcgt

CCCTTTTCTGGAGACTAAATAAAATCTTTTATTATcgatagatcccgggtcggcattctactctattccttctgcccctcg
gacgagtgctggggcggttccactatcggcgagtaactctacacagccatcgggtccagacggcgcgcttctgcccgg
gcgatttggtacgcccgcagtcgggctccggatcggacgattgctgcgcatcgacctgcccgaagctgcatcatc
gaaattgcccgtcaaccaagctctgataagattggtcaagaccaaatacgaggacataacgcccggagcgcggcgatccctg
caagctccggatgcctccgctcgaaagtagcgcgtctgctgcctacatacaagccaaacacggcctccagaagaagatgttg
gcgacctgctattgggaatccccgaacatcggctcgctccagtcgaatgacgcgtgttatgcgggccattgtccgtcaggac
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aacggtgaggccatggtGGCTTTACCAACAGTACCGGAATGCCAAGCTTGCGGCCCTTAAGAGCTGTAATTGAACCTGG

GAGTGGACACCTGTGGAGAGAAAGGCAAAAGTGATGTCAGTAAGACCAATAGGTGCCTATCAGAAACGCAAGAGTCTTCT

CTGTCTCGACAAGCCCAGTTTCTATTGGTCTCTCTTAAACCTGTCTTGTAACCTTGATACTTACCTGCCAGTGCCCTCAGC

(2) Ahhh: Survival construct

2.) Ahhh: epsilon-cFas' (CD8 or mLyf2) -Ires-Hygro-BGHpolyA also in C12s backwards

atcacgagggcccttctgtcttcaagaacagcttctgtcttaggagtttccataacatcccaaaactcaaaatatataaagc
ataggactgttctatgccctagttatataatagtaaatcaattacggggtcatagttcatagcccatataggagttccg
cggtacataacttacggtaaatggcccgctggctgacggcccaacgaccccgcccatgacgtcaataatgacgtatg
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TGCTATTGCTCTCCCAATCCTCCCCCTTGCTGTCTCTGCTGCTCCCCACCCCAAGATAAGATGACACCTACTCAGACAA

TGCGATGCAATTTCCTCATTTTATTAGGAAAGGACAGTGGGAGTGGCACCTTCCAGGGTCAAGGAAGGCACGGGGGAGGG

GCAACAACAGATGGCTGGCAACTAGAAGGCACAGTCGAGGCTTAGCTTGCCAAACCTACAGGTGGGGTCTTTTCATTCCC

FIG.- 13A

ACCAACTTctgcaggaaattcctggacagctcccagatgatcagtaaccgtggttgtattctgtccgggcagtgagc
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CTGTATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGagtgactcaaccaagtcattctgagaatagtgatgcggcga
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FIG.- 13D